Available online at www.sciencedirect.com

ScienceDirect

Procedia Computer Science 100 (2016) 818 – 825

Procedia Computer Science

Conference on ENTERprise Information Systems / International Conference on Project MANagement / Conference on Health and Social Care Information Systems and Technologies, CENTERIS / ProjMAN / HCist 2016, October 5-7, 2016

Public-Private Partnership: Transaction Costs of Tendering

Kristine Thomassen[a], Siril Vassbø[a], Espen Solheim-Kile[a*], Jardar Lohne[b]

[a]*Department of Economics and Finance, University of Agder, Kristiansand 4630, Norway*
[b]*Department of Civil and Transport Engineering, Norwegian University of Science and Technology (NTNU), Trondheim 7491, Norway*

Abstract

What are the transaction costs of participating in a public-private partnership (PPP) tender? Prior research indicate that there is a significant amount of resources required. However, few researchers seem to measure transaction costs directly. The purpose of this paper is therefore to fill this knowledge gap by presenting estimated transaction costs from both public and private actors. The underlying approach for this research was a case study of a new primary school in Norway. This case was chosen because of the expedient access to detailed information of the tendering process. The main source of data was documents and estimated figures obtained from public and private actors involved. Additionally, focused interviews were used to clarify any ambiguities. We find that there are significant costs involved that can be explained by the nature of the PPP tendering process. These findings contribute to a better understanding of the costs associated with a PPP tender process, providing an opportunity for public actors to establish a more attractive arena for private actors to participate, together with a better-informed decision making from private actors.

Peer-review under responsibility of the organizing committee of CENTERIS 2016

Keywords: Public-private partnership; PPP; transaction costs; tendering; cost management

1. Introduction

In 2015, *RIF – Association of Consulting Engineers, Norway* [1], developed an overview of the current state of the infrastructure in Norway. The report revealed that there has been a decay on public buildings for a long time, and

* Corresponding author. Tel.: +47-900-18-835.
E-mail address: espen.solheim-kile@kruse-smith.no

Peer-review under responsibility of the organizing committee of CENTERIS 2016
doi:10.1016/j.procs.2016.09.230

that there is a large backlog on maintenance. Two thirds of the public buildings are considered unsatisfactory. The calculated total maintenance and upgrade needs of public buildings and infrastructure equals 275 billion euros. With increasing challenges related to climate change, demography, and changes in settlement, the investment needs will only increase. However, a sustainable solution for the long run requires more than spending more money. To get the most out of every penny that is spent when public buildings are planned, built, operated and maintained, there is a need for changes in how the public sector procures and manages its projects; there is a need for adopting new models [1].

One such model is Public-private partnership (PPP). This procurement model was first introduced in England in 1992 [2]. There are many different types of PPPs and the models applied differ from country to country [3]. Consequently, the research literature struggles to agree upon one common definition of PPP. One of the contributions is provided by Engel et al.: "… a PPP is defined as an agreement by which the government contracts a private company to build or improve infrastructure works and to subsequently maintain and operate them for an extended period (for example 30 years) in exchange for a stream of revenues during the life of the contract. … at the end of the contract the asset reverts to government control." [4]. This is the definition we use in this article.

According to Parker and Hartley [5], the intention of a PPP is that government sets either the general objectives or specific outputs, and leaves the private sector to design and manage the project. Proponents of PPPs typically emphasize the benefits of the private sector becoming responsible for the initial design, construction, operation, and maintenance, thereby aligning incentives for low-cost construction with minimizing life-time costs of operation [5, 6].

As an attempt to accommodate these investment needs, Kristiansand municipality chose to undertake the construction of a new primary school as a PPP project. This was the first school to be built as a PPP in this municipality. The ideology justifying this choice was to utilize private actors' competence in the construction and operation of a public building in order to obtain a more efficient use of government funds in a long-term perspective. The arguments for choosing the PPP model was that pressure for efficiency in the construction process and reduced maintenance costs will stimulate creative measures from the private actors.

In recent years, a number of different projects have been run as PPPs in Norway. Consequently, this has started an ongoing debate amongst practitioners and commentators whether the competitive tender of PPP projects is too costly in terms of the transaction costs involved. Considerable research has been conducted on the subject of transaction costs in relation to PPPs. Nevertheless, to our knowledge there has been less focus on identifying the exact costs of PPP tendering. This paper seeks to fill this knowledge gap by attempting to answer the following research questions:

- What are the actual transaction costs of PPP tendering?
- How can these costs be explained by the nature of the PPP tendering process?

This paper will not try to compare transaction costs in PPPs to those in traditional procurement of investment projects, nor to contrast transaction costs with the argued cost savings related to PPP. The objective of this paper is to identify the actual transaction costs of a PPP tendering process. The research measures the tender costs for three bidders of a PPP school project in Norway as well as for the local authority. The aim is to provide a guideline for potential bidders and local authorities that shows estimated cost of participating in this competition.

The paper is structured as follows: In the next section, a theoretical framework for discussing transaction costs in tendering is developed. Section three presents the research methods applied for this study. Findings are presented in section four and discussed in relation to the research questions in section five. The sixth and final section concludes the paper with recommendations for further research on the topic.

2. Theoretical framework

Transaction cost theory was initially developed by Ronald Coase, who referred to transaction costs as "the cost of carrying out a transaction by means of an exchange on the open market" [7]. This theory was built upon and popularized by Oliver Williamson [8-10], who stated that transaction costs are the economic equivalent of friction in physical systems and distinguished from production costs [8]. Soliño and Gago de Santos [11] explains that in economic relationships (trade, contracts, firms, and markets), anything that impedes the specification, monitoring or enforcement of a transaction is a transaction cost.

In Williamson´s [8, 10] approach, transaction costs are used to understand the different forms of economic organization and contractual arrangements. Soliño and Gago de Santos (2010) [11] points out that what is important in this approach is the cost of conducting transactions in one organizational or contractual form, relative to others. Thus, transaction costs will be the comparative costs of planning, adopting, and monitoring task completion under alternate governance structures [11]. Williamsons [12] development of transaction cost theory was based on the idea of contracting under conditions of imperfect and asymmetrically distributed information [13]. The theory of transaction costs recognizes that agreement and exchange frequently occurs in the context of parties possessing imperfect information about all aspects of the exchange [14]. Moreover, in some cases, exchange is characterized by information asymmetries with one party to the transaction possessing knowledge that other parties do not [14].

The analytic framework of transaction costs theory relies on two main assumptions about human behavior; bounded rationality and opportunism [15, 16]. Transaction cost theory poses the problem of contracting by assuming that human agents are subject to bounded rationality, where behavior is "intendedly rational but only limited so" [17]. The concept of bounded rationality recognizes the limits of human foresight and cognition and how these limits give rise to transaction costs [14]. However, the main problem causing transaction costs is opportunism, and the information problem caused by bounded rationality makes opportunism possible [6]. Williamson [18] describes opportunism as "self-interest seeking with guile" [8]. Taken together, bounded rationality and opportunism give rise to the possibility that one or more of the parties to exchange will exploit their information advantage at either the pre- or post-contractual stages [14].

Furthermore, there are certain characteristics of transactions that tend to cause opportunism problems [6]. These characteristics are asset specificity and uncertainty [8, 10]. Ho and Levitt [6] explain that transaction-specific assets/investments are made for a particular transaction, that have a significantly lower value, or in worst case no value at all, if they must be redeployed for other purposes. Their idiosyncratic nature gives rise to a safeguarding problem, because market competition will not restrain opportunistic exploitation [16]. The second transactional characteristic leading to the opportunism problem is uncertainty [6]. When the relevant contingencies concerning a transaction, such as innovation and technology, are too unpredictable to be addressed ex-ante, it is difficult to have an efficient contract that eliminates and safeguards against potential renegotiation [6]. The primary consequence of uncertainty is an adaptation problem; that is, difficulties with adjusting agreements increase transaction costs [16].

Dudkin and Välilä [19] explains that there are several potential reasons why transaction costs in PPPs would be high. They argue that the main sources of higher transaction costs in PPPs are their long-term character, ownership and financing structures, and risk-sharing features. Due to all these reasons, the degree of contractual incompleteness is high in the case of PPPs, and attempts to reduce that contractual incompleteness give rise to correspondingly high transaction costs [19].

Regarding the measurement of transaction costs in empirical studies, a direct measurement would simply be the economic value of resources used in locating trading partners and executing transactions [20]. Another common measurement of transaction costs is the difference between the price paid by the buyer and the amount received by the seller [21, 22]. Soliño and Gago de Santos [11] presented a classification for the measurement of transaction costs:

1. *Ex-ante* transaction costs
    - Search and information costs: transaction costs incurred in determining whether the required good is available on the market, its lowest price and so on.
    - Bargaining costs: costs required to reach an acceptable agreement with the other party of the transaction, drawing up an appropriate contract.
2. *Ex-post* transaction costs
    - Policing and enforcement costs: the costs of ensuring that the other party fulfils the terms of the contract and of taking appropriate action (often through the legal system) if not.

Transaction costs in the context of PPP tendering refer to the *ex-ante* transaction cost of the listing above. That is the costs of establishing a partnership and to reach agreement on a contract. Hence, they encompass legal, financial, and technical advisory costs incurred by both public and private sector in the tendering process of a project [19]. Costs of organizing the bidding process, construct a proposal, negotiation meetings and evaluation of the bids are included.

The theoretical framework described in this paper is designed to examine the transaction costs of a tendering process in the case of PPP. Its particular focus is on the transaction cost features of the stages of establishing a partnership and constructing a proposal for the project.

3. Research methodology

The research was carried out on the basis of a literature review focusing on providing a theoretical background and a comprehensive understanding of PPP and transaction costs related to the tendering process. Calls were made to reach out to project managers of the project groups (one from the local authority and three from the private sector), who agreed to provide us with documents and information regarding the tendering. The total costs of the tendering are presented in Table 2 in the findings section. We have arrived at these figures on the basis of estimates given to us directly by project managers in all of the four project groups. Focused interviews with twelve key actors were carried out to clarify ambiguities in the document study. In order to ensure that diverse angles of the tendering process were captured, project managers, managing directors, engineers, legal professionals, head of the user group, cost accountants and economists were contacted. By using multiple sources of evidence, we were allowed to compensate weaknesses of one approach with the strength of another [23]. Further, use of multiple sources will increase confidence that the case study will describe the event accurately [24]. It is important to emphasize that the figures presented are estimates, as the project managers (or anyone else) often do not know the exact numbers. The hours spent are usually not registered for each specific project. However, from private sector we received an estimate ranging from 80 to 110 euros per hour. From the local authority, we only obtained an estimate of hours spent. As a consequence, the internal labor costs were calculated based on an hourly rate similar to the private sector. There are probably other costs associated with the tendering that we did not manage to measure. Consequently, the estimate is probably conservative.

To be able to measure transaction costs in a tendering directly, we needed detailed information from client and bidders. The case was chosen because it gave an opportunity to get in contact with key actors only two months after the preferred bidder was selected. With the project fresh in the actors´ memory, they were able and willing to provide us with detailed information of the actual tendering costs of the project. Even though it might be hard to formally generalize findings from a single case design, this does not mean that it cannot enter into the collective process of knowledge accumulation in a given field or in a society [25]. The transaction costs considered are confined to the tendering process only, leaving aside the transaction costs incurred after the preferred bidder was chosen and the contract was signed. One reason for this was that the project had not come far enough to study the *ex-post* phase. However, this made it easier to narrow down the scope of the research and avoid information overload. Regardless, the tendering process might be the most substantial element of PPP transaction costs as it contains the early design-phase and the negotiation meetings, which are highly resource intensive parts of the process.

4. Findings

After reviewing project documents and interviews with public and private actors, we understood that the complexity of this tender process was high, especially considering the relatively small size of the project. In order to illustrate this complexity, an overview of the process was developed. We found that the process could be broken up into nine stages, making it prone to high transaction costs. These stages are summarized in Table 1. Processes that are similar to those in traditional procurement methods are not included in the overview; that is the assessment of whether to renovate or to build a new school, together with the formulation of the functional demands of the building.

Table 1. PPP tender process complexity.

Stage	Tender process complexity
1. Developing the procurement team	What is different under a PPP is that the public procurement team is supplemented with law and finance expertise in addition to the traditional roles of a construction project team. The selected team needed to acquire knowledge of the PPP model. In

		order to do that, they went on a study tour to other municipalities in Norway that had more experience with PPPs. They obtained second hand examples and documents that these municipalities had used.
2.	**Deciding tactics**	The procurement team had to decide tactics for the conduct of the competition. Questions raised was what kind of competition they wanted (interaction model or strict legal model); how many negotiating meetings; how to act towards the bidders through the negotiation meetings; and when to request a final proposal.
3.	**Information meeting for potential bidders**	Official announcement of the project. With help from a consulting firm, an information meeting with a presentation of the project was held in Kristiansand city hall to attract potential bidders. In addition, a contract notice in the Tenderers Electronic Daily (TED) was published.
4.	**Pre-qualification of bidders**	Interested providers had to submit a series of pre-defined tests and documentation including the company´s financial strength and experience with similar projects.
5.	**Selection of shortlists**	A shortlist was drawn up on the basis of these tests.
6.	**Invitation to participate in the tender**	Because of the cost of the tender process, this invitation is usually issued to between three and five bidders. In this case, there were only three bidders judged relevant for the project. The invitation specifies the service required in output terms, proposed contractual terms, terms and conditions for the submission of bids and criteria for evaluation [26].
7.	**Presentation and negotiation meetings**	Four meetings with each of the three bidders were held, where the bidders presented all parts of the offer. The offer was then reviewed in order to clarify ambiguities, negotiate issues, and to give the bidders opportunities to make adjustments to their proposals before the final submission of bids. The number of jurors participating in these meetings ranged from 6-10 people, depending on the topics for negotiation.
8.	**Receipt and evaluation of final bids**	When the final bids were received, they were evaluated by a wide number of pre-specified points. These points included price, design and qualities, in addition to an overall understanding of the project. The proposals received a weighted score based on these criteria.
9.	**Selection of the preferred bidder and final evaluation**	Based on these scores, the preferred bidder was selected. Before the contract could be signed, a political approval of the selected bidder was required.

All these stages indicate that a PPP tender process is prone to substantial transaction costs. Additionally, there is a series of contractual documents the parties need to evaluate. Project documents included the following:

- Overall PPP agreement that gathers all other agreements
- Agreement regulating the design and construction phase
- Hiring agreement
- Operating agreement
- Lease of land. Contract of ground rent
- Inventory agreement

The total costs of the tendering that we found are presented in Table 2 below.

Table 2. Private sector cost of tendering (All figures in EUR.).

Private sector costs exclusive VAT	Bidder X1	Bidder X2	Bidder X3
Internal labor costs	75 000	33 000	68 000
Architect/landscape architect	82 000	165 000	132 000
Technical advisory	20 000	11 000	6 000
Legal advisory	7 000		11 000
Financial advisory	6 000	17 000	17 000
Subcontractors	11 000		33 000
Rendering (computer graphics)	5 000	3 000	3 000
Sum	**206 000**	**229 000**	**270 000**

Table 3. Public sector cost of tendering. (All figures in EUR.)

Public sector costs exclusive VAT	Local authority
Internal labor costs	50 000
Preparation of tender documents	110 000
Property planning	17 000
Technical and financial advisory	13 000
Legal advisory	5 000
Contractor remuneration	55 000
Sum	**250 000**
IN TOTAL	**955 000**

It is important to emphasize that the costs that are directly related to the design of the school must be considered as production costs, not as transaction costs. These costs are internal labor costs and property planning for the public sector, and internal labor costs, architect costs, technical advisory and direct cost of subcontractors for the preferred bidder. However, not all of the internal labor cost for these two actors can be directly related to the design of the school. Much time was spent on negotiation meetings and preparation for these meetings. Contrary, some of the points discussed could have been directly related to for example technical solutions for the building. Costs of searching for subcontractors and negotiations for contracts with these are also transaction costs. However, these transaction costs are difficult to measure as it is hard to find out how much resources that were spent every time a potential subcontractor were asked for a price offer on a service. There is therefore some uncertainty to these figures. That the estimates from the project managers contains similarities is promising, and give us a picture of the proportions of the tendering costs involved. It is not certain that the small differences we observe among the actors exist, as they might as well stem from imprecise estimates from the project managers.

For the losing bidders, the tendering costs can be seen as waste as they are asset specific, meaning that the work that is done cannot be used for another project. The drawings are made for this school specifically, with land-use plans adapted to the number of pupils attending the school, grade etc., in addition to building plot adjustments and daylight calculations.

Based on this reasoning, we arrived at around 70-80 percent of total tendering costs are transaction costs. With total project costs of EUR 11 million, *ex-ante* transaction costs equal around 7-8 percent of total project cost.

5. Discussion

This research has examined the transaction costs of tendering under the PPP model of providing infrastructure. It has attempted to answer what these transaction costs are, and how they can be explained by the nature of the PPP tendering process. Contributing to the procurement literature, our study is among the first to do so in such a detailed manner for the tendering phase of a PPP project.

By presenting a nine-stage model of the tender process, we have shown that the complexity of tendering for PPPs is high, resulting in transaction costs related to all of the stages. The transaction costs stem from searching for potential bidders, organizing the bidding process, construct of proposals, search for subcontractors, negotiation meetings and evaluation of bids. Consequently, transaction costs made up around 70-80 percent of total tendering costs. According to the transaction cost theory, this means that most of the resources spent are waste. Even if there are high transaction cost related to the project, experiences from other PPP projects in Norway suggests that the final product is of high quality for the users [27]. Therefore, we do not consider all of the transaction costs as waste. The competition between the participants contribute to more pressure for carefully planned solutions. On the other hand, the level of detail during the tendering process could have been reduced without causing significant reduction of quality of the final product. By moving more of the design details to the *ex-post* phase, the losing bidders could have avoided some of these transaction costs.

The size of this project in terms of project costs was approximately EUR 11 million, which is considerably less than the 24 million euro criteria for being counted as a PPP project in the UK [28]. Transaction costs are not

necessarily increasing proportionally to project size. Therefore, there are reasons to argue that this project was too small in respect to the complexity and the high transaction costs involved in the tendering.

The tendering costs amounted to around 200 000 euros each for all actors, both public and private. The level of asset specificity in the investments were high. According to transaction cost theory, asset specificity increases the probability of opportunism. Additionally, competition among participants increase this probability. Through the tendering process, measures were made in order to prevent opportunistic behavior. Extensive work in designing the contract was carried out so that the public actor preferences regarding the school would be fulfilled, at a reasonable price. The specificity level of the contract and the long-term ownership meant that there were limited scope for the private actors to choose solutions diverging from the municipality´s desire. By specifying in the contract that the building should be of a condition equivalent to a new building (state level 1) during the contract period, limited the private actors motivation to cheat on quality. Moreover, the negotiation meetings ensured that the parties´ interests were discussed during the tender process. The contract work coupled with extensive negotiation meetings contributed therefore to reduce the possibility of opportunistic behavior. However, attempts to secure against opportunism was driving the transaction costs upwards in the tender process.

In traditional procurement methods, the long-term risk is usually borne by the public party. However, in PPPs the risks are allocated between the public and the private actors. Consequently, the contracts need to contain a wide range of issues including cost overruns, construction delays, and long-term maintenance of the building. In addition, this was the first PPP project for Kristiansand municipality. In order to protect themselves against contingencies to the contract, the level of specification was high. Extensive use of external consultants for legal, technical and financial service advice were necessary for both sectors, leading to higher transaction costs. However, experience from projects like this one, together with standardization of contractual documents, are likely to reduce some of the transaction costs in future PPP projects.

When deciding tactics for the competition and especially the negotiation meetings, the public actor was clear that it wanted to optimize each project. After seeing the first drafts of the bidder´s proposals, the public actor got ideas and became more certain of what they wanted the facility to be like in terms of design and plot utilization. Thus, the public actor had more information about who was closer to winning as the bidders were not allowed to see the others´ proposal. This approach allowed the municipality to maintain competition in the bidding process. However, this approach is also likely to increase transaction costs. At one point, one of the bidders was rather far behind in terms of the solution that the public actor desired. The public actor decided to inform the bidder of this, and the bidder in question then decided to design a new proposal for the school building, resulting in far higher architect costs. Transaction costs like these can be lowered if the public actor explicitly expresses their preferences at an early stage of the tendering.

Since PPP contracts usually extends over a long period of time, e.g. 25 years in this case, the contract is inevitably incomplete in many ways. During the contract period, there is likely to occur unforeseen events as for example innovations and technical advances. The public actor wanted the bidders to take this into consideration when planning for the operation and maintenance costs. However, the private actors were calculating with today´s solutions having the same efficiency for the whole contract period. For them, any efficiency gains were seen as profit. This is an example of how uncertainty makes it difficult for the public actor to obtain an efficient contract that safeguards against private actors favoring alternatives that enhance their own utility. The long contract period together with uncertainty make the contract design in the *ex-ante* stage complicated and are significant sources of transaction costs in the tender process.

6. Conclusion

This paper seeks to contribute to the PPP literature by measuring the actual transaction costs of tendering in the case of the contract to design, build, operate and finance a primary school in Norway. Although this study is restricted in scope, it provides new insights for the procurement literature. The level of transaction costs in PPP tendering are often understated or ignored. By illustrating the complexity and actual transaction costs involved in a PPP tendering, both public and private sector participants will get a better picture of what they are getting into when participating in these competitions.

It is necessary to bear in mind that our conclusions are based on one project and we therefore advise caution about generalizing from them. However, the findings contribute to a deep understanding of actual transaction costs, laying the groundwork for further studies in this area. Further research is necessary in order to compare transaction costs of tendering in relation to project size, project type, and between countries. An interesting approach would be to see if we are using PPP on the wrong projects.

References

1. Rådgivende Ingeniørers Forening (RIF). *Norges tilstand 2015: State of the Nation*. 2015, Rådgivende Ingeniørers Forening.
2. Robinson HS, Scott J. *Service delivery and performance monitoring in PFI/PPP projects.* Construction Management and Economics, 2009. **27**(2): p. 181-197.
3. Grimsey D, Lewis MK. *Public Private Partnerships: The Worldwide Revolution in Infrastructure Provision and Project Finance*. 2004, Cheltenham: Edward Elgar Publisher.
4. Engel E, Fischer RD, Galetovic A. *The Economics of Public-Private Partnership: A Basic Guide*. 2014: Cambridge University Press.
5. Parker D, Hartley K. *Transaction costs, relational contracting and public private partnerships: a case study of UK defence.* Journal of Purchasing and Supply Management, 2002. **9**(3): p. 97-108.
6. Ho SP, Levitt R, Tsui C, Hsu Y. *Opportunism-Focused Transaction Cost Analysis of Public-Private Partnerships.* Journal of Management in Engineering, 2015. **31**(6): p. 04015007.
7. Coase RH. *The Nature of the Firm.* Economica, New Series, 1937. **4**(16): p. 386-405 (p. 395).
8. Williamson OE. *The Economic Institutions of Capitalism - Firms, Markets, Relational Contracting*. 1985, New York: The Free Press. (p. 47).
9. Williamson OE. *The Mechanisms of Governance*. 1996: Oxford Univeristy Press.
10. Williamson OE. *Markets and Hierarchies Analysis and Anti-trust Implications: A Study in the Economics of Internal Organization* 1975, New York: Free Press.
11. Soliño AS, Gago de Santos P. *Transaction Costs in Transport Public–Private Partnerships: Comparing Procurement Procedures.* Transport Reviews, 2010. **30**(3): p. 389-406.
12. Williamson OE. *Public and Private Bueraucracies: A Transaction Cost Economics Perspective.* Journal of Law, Economics, and Organization, 1999. **15**(1): p. 306-342.
13. De Schepper S, Haezendonck E, Dooms M. *Understanding pre-contractual transaction costs for Public–Private Partnership infrastructure projects.* International Journal of Project Management, 2015. **33**: p. 932-946.
14. Reeves E. *The Practice of Contracting in Public Private Partnerships: Transaction Costs and Relational Contracting in the Irish Schools Sector*. Public Administration, 2008. **86**(4): p. 969-986.
15. Rindfleisch A, Heide JB. *Transaction Cost Analysis: Past, Present, and Future Applications.* Journal of Marketing, 1997. **61**(4): p. 30-54.
16. Geyskens I, Steenkamp J-BEM, Kumar N. *Make, Buy, or Ally: A Transaction Cost Theory Meta-Analysis* The Academy of Management Journal, 2006. **49**(3): p. 519-543.
17. Simon HA. *Administrative Behavior*. 1961, New York: Macmillian. p. xxiv
18. Williamson OE. *Markets and Hierarchies: Analysis and Antitrust Implications*. 1983, London: Free Press/Collier Macmillan.
19. Dudkin G, Välilä T. *Transaction Cost in Public-Private Partnerships: A First Look at the Evidence*. 2005, European Investment Bank.
20. Benham A, Benham L. *Measuring the Costs of Exchange in Institutions, Contracts and Organizations: Perspectives from New Institutional Economics*, C. Mènard, Editor. 2000, Edward Elgar: Cheltenham, UK. p. 367-375.
21. Demsetz H. *The Cost of Transacting.* The Quarterly Journal of Economics, 1968. **82**(1): p. 33-53.
22. Bhardwaj RK, Brooks LD. *The January Anomaly: Effects of Low Share Price, Transaction Costs, and Bid-Ask Bias.* The Journal of Finance, 1992. **47**(2): p. 553-575.
23. Blumberg BF, Cooper DR, Schindler PS. *Business Research Methods*. 2014, London: McGraw-Hill Education.
24. Yin RK. *Case Study Research: Design and Methods*. 5th ed, ed. C. Corporation. 2014, Los Angeles, London, New Delhi, Singapore, Washington DC: SAGE Publications
25. Flyvbjerg B. *Five Misunderstandings About Case-Study Research.* Qualitiative Inquiry, 2006. **12**(2): p. 219-245.
26. HM Treasury Taskforce. *Step by Step Guide to the PFI Procurement Process*. 1998, HM Treasury Publication: London.
27. Berg TF, Edvardsen DF. *Livsløp/OPS-kontraktene Persbråten videregående skole og Høybråten grunnskole.* 2009, Oslo: SINTEF Byggforsk rapport 33.
28. HM Treasury. *Private Finance Initiative: Meeting the Investment Challenge*. 2003, The Stationery Office: London.